

Amendment to the Drawings:

The attached 3 sheets of replacement drawings includes changes to Figs. 1 and 2 and adds new Figures 7A, 7B, 8A, and 8B. The sheet that includes Figs. 1 and 7A, 7B, replaces the original sheet including Fig. 1, the sheet that includes Figs. 2 and 3 replaces the original sheet including Figs. 2 and 3 and the sheet that includes Figs. 8A and 8B is a new sheet. In Figs. 1 and 2, previously omitted reference numbers have been added, which can be easily seen and thus, no annotated sheet is included.

Attachment: 3 Replacement Sheets

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REMARKS/ARGUMENTS

Claims 1-21 and 26-30 were pending of which claim 7 was withdrawn and claims 1-6, 8-21, and 26-30 were rejected. Reconsideration is respectfully requested.

Claims 1, 5, 8-10, 12-16, 18-21, and 26-29 have been amended. The amendments to claims 1, 5, 8-10, 16, 18-21, and 27-29 are discussed below. The amendments to claims 12-15 and 19-20 are to fix claim dependency, to eliminate superfluous language, and to make claim terms consistent. No new matter has been added to the claims.

Applicant notes that in the previous amendment to the claims dated, April 29, 2009, claim 21 was amended and inadvertently marked as original. The amendment to claim 21 included the following: “a plurality of elongate rectangular mark structures of equal length and in parallel array” and “wherein the test zones making up the at least one pair of test zones ~~or each pair~~ are laterally displaced relative to each other”. The present amendment to the claims treats claim 21 as having been properly amended. If there are any questions or concerns about the entry of the previous amendment, the Examiner is invited to call the undersigned.

Drawings

The Examiner objected to the drawings as failing to show a first layer, a second layer, a first mark portion and a second mark portion. Figures 7A, 7B, 8A, and 8B have been amended showing these elements. Support for these new figures is found in the present application at page 20, line 24 to page 22, line 14, as well as, e.g., page 8, lines 16 to page 9, line 11 and elsewhere in the specification, such as the claims. Thus, no new matter is added.

The Examiner also objected to the drawings as failing to show labels for the first and second mark portions, the first and second mark sections, test zones and pairs of test zones. Figs. 1 and 2 have been amended to include the requested labels. Support for these new figures is found in the present application at page 20, line 24 to page 22, line 14, as well as, e.g., page 8, lines 16 to page 9, line 11 and elsewhere in the specification, such as the claims. Thus, no new matter is added.

Reconsideration and withdrawal of these objections is respectfully requested.

Specification

The Examiner objected to the specification as containing informality in the form of “axis” and “axes” being used interchangeably at page 10, line 18 and line 21 and elsewhere in the specification. Applicant points out that “axes” is the plural form of “axis” and submits that the terms are not used interchangeably. The term “axes” is used when discussing more than one “axis”.

Reconsideration and withdrawal of these objections is respectfully requested.

Amendments to the specification have been made to include the reference numerals for the elements shown in the amended and new figures 1, 2, 7A, 7B, 8A, and 8B. Support for these amendments is found in the present application at page 20, line 24 to page 22, line 14, as well as, e.g., page 8, lines 16 to page 9, line 11 and elsewhere in the specification, such as the claims. Thus, no new matter is added.

Claim Objections

Claims 5, 10, 16, 27-29 were objected to as containing informalities. In particular, the Examiner stated with respect to claims 5, 28, and 29, that the term “axes” is used, while claim 2 uses “axis”.

As discussed above, Applicant points out that “axes” is the plural form of “axis” and submits that the terms are not used interchangeably, but that “axes” is used when discussing more than one “axis”. Nevertheless, claim 5 has been amended to remove the term “the” before “mirror axes” as there is no antecedent basis and claims 28 and 29 have been amended to change refer to “axis” in the singular.

Claims 10 and 27 were objected to for the use of the term “centres” as opposed to “centers”. Applicant notes that this application originated in England, where “centre” is correct. Nevertheless, Claims 10 and 27 have been amended per the Examiner’s request. Claims 8 and 26 have also been so amended.

Claim 16 was objected to as it should recite “elongate rectangular mark structure”. Appropriate correction has been made.

Reconsideration and withdrawal of these objections is respectfully requested.

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Claim Rejections – 35 U.S.C. §112

Claim 28 and 29 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner stated that in claim 28, there was never a previous claim or description of "... and long axes of the rectangular mark structures of the first mark section and the second mark structures are co-linear within each test zone...". Applicant respectfully requests reconsideration.

Claim 28 has been amended to recite "the long axis of each rectangular mark structure of the first mark section is collinear with a long axis of a corresponding rectangular mark structure of the second mark section within each test zone". Claim 29 has been similarly amended. Support for this feature is found, e.g., in Figures 1 and 2 and the supporting text. For example, page 21, lines 9-10 of the application as filed states "The pairs of lines are designed to be printed exactly side by side." Similarly, page 22, lines 7-8 recites "The pairs of lines in each zone are designed to be printed exactly side by side."

Applicant points out that the subject matter of the claim "need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement." See, MPEP §2163.02. Applicant submits a person of ordinary skill in the art would recognize that Applicant possessed the claimed invention at the time of filing based on the figures as well as the text, such as that cited above.

Claims 5, 9, and 28 were also rejected under 35 U.S.C. §112, second paragraph, as being indefinite. With respect to claim 5, the Examiner stated that the features "the rectangular directions" and "the mirror axes of the imaging equipment" have insufficient antecedent basis. Appropriate correction has been made. Applicant notes that claim 5 has been amended to recite "the axes of the square or rectangular shape". The term "axes" is used, as a square or rectangle has more than one axis. Additionally, square or rectangular shapes inherently have axes, and thus, "the axes" inherently has antecedent basis.

Claim 9 was rejected as it is impossible for "a single such pair" to be disposed in one direction and a second direction. Appropriate correction has been made.

Claim 28 was rejected for the recitation of "long axes" and "the second mark structures". Correction has been made.

Reconsideration and withdrawal of these rejections is respectfully requested.

Claim Rejections – 35 U.S.C. §102

Claims 1-6, 8-11, 16, 17, 19, 21, 26, and 27 were rejected under 35 U.S.C. §102(b) as being anticipated by Hsu (6,083,807) (“Hsu”). Reconsideration is requested.

Amended independent claim 1 recites “the plurality of elongate rectangular mark structures of the first mark section and the plurality of elongate rectangular mark structures of the second mark section are positioned side by side in a direction that is perpendicular to a direction of measured displacement between the first mark section and the second mark section” and “test zones making up the at least one pair of test zones are laterally displaced relative to each other along at least one of a first direction and an orthogonal second direction by a distance great enough to avoid errors in measurement caused by proximity effects”. Independent claim 21 has been similarly amended to state “the plurality of elongate rectangular mark structures of the first mark section and the plurality of elongate rectangular mark structures of the second mark section are positioned side by side in a direction that is perpendicular to a direction of measured displacement between the first mark section and the second mark section,” and “test zones are laterally displaced relative to each other along at least one of the said first direction and said second direction by a distance great enough to avoid errors in measurement caused by proximity effects”. Support for these amendment to claim is found, e.g., in Figures 1 and 2 and the supporting text, including page 21, lines 11-13, page 22, lines 5-14, as well as page 12, lines 3-6 and page 13, lines 17-21; and page 7, line 25-page 8, line 2. Thus, no new matter is added and written description is present.

Hsu discloses a conventional bar-in-bar overlay measuring mark with outer marks 61-64 and inner marks 65-68, except that the outer marks 61-64 include two bars. The test zone (61 and 65) in Hsu includes rectangular mark structures (61) for a first mark section and rectangular mark structures (65) for a second mark section, but these mark structures are not “positioned side by side in a direction that is perpendicular to a direction of measured displacement between the first mark section and the second mark section” as recited in claims 1 and 21. For example, the direction of measured displacement for the test zone 61, 65 in Hsu is along the X axis, i.e., right to left on the page. The bars 61 and 65, however, are positioned side by side along that measurement direction, i.e., right and left on the page, not perpendicular to the direction of measured displacement as required by claims 1 and 21. The same is true for any test zone in Hsu, e.g., zone 62, 66; zone 63, 67; or zone 64, 68.

Thus, Applicants respectfully submit that claims 1 and 21 are patentable over Hsu. Reconsideration and withdrawal of this rejection is respectfully requested. Additionally, Applicant submits that claims 1 and 21 are patentable over WO02/19415, previously cited. Claims 2-6, 8-11, 16, 17, and 19 depend from claim 1, and claims 26 and 27 depend from claim 21 and are therefore patentable for at least the same reasons.

Claims 1, 16, 18, 28-30 were rejected under 35 U.S.C. §102(e) as being anticipated by Lan (7,136,520) (“Lan”). Reconsideration is requested.

Lan is similar to Hsu in that it discloses a conventional bar-in-bar overlay metrology pattern, except Lan disclose the use of additional bars one additional layers, e.g., bars 110a, 110b are on a first layer 100 (Fig. 2A, col. 3, lines 62-65); bars 220 are on a second layer 200 (Fig. 2C, col. 4, lines 4-6), bars 330 are on a third layer 300 (Fig. 2C, col. 4, lines 13-15); and bars (box) 440 are on a fourth layer 400 (Fig. 2D, col. 4, lines 39-43). Lan explains that in operation, the bars 110 are referenced against pattern 440 to determine alignment along the Y axis (col. 4, lines 47-56), and that bars 220 and 230 are referenced against each other to determine a center position along the X direction (col. 4, lines 59-67), which is then compared to the pattern 440 to determine alignment along the X axis (col. 4, line 67-col. 5, line 2).

Thus, Lan suffers from the same deficiency as Hsu with respect to claim 1, namely that Lan does not disclose mark structures 110, 440 or 220/330, 440 that are “positioned side by side in a direction that is perpendicular to a direction of measured displacement between the first mark section and the second mark section”.

Amended independent claim 28 recites “the test zones being laterally displaced relative to each other by a distance great enough to avoid errors in measurement caused by proximity effects,” and “the long axis of each rectangular mark structure of the first mark section is collinear with a long axis of a corresponding rectangular mark structure of the second mark section within each test zone”. Support for these amendment to claim is found, e.g., in Figures 1 and 2 and the supporting text, including page 21, lines 11-13, page 22, lines 5-14, as well as page 12, lines 3-6 and page 13, lines 17-21; and page 7, line 25-page 8, line 2. Applicant points out that as discussed above, the subject matter of the claim “need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.” See, MPEP §2163.02. One of ordinary skill in the art would recognize from, e.g., the figures 1 and 2, that the “long axis of each rectangular mark structure of the first mark section is collinear with a long axis of a corresponding rectangular

mark structure of the second mark section within each test zone". Thus, no new matter is added and written description is present.

Moreover, Lan's overlay mark does not disclose "the long axis of each rectangular mark structure of the first mark section is collinear with a long axis of a corresponding rectangular mark structure of the second mark section within each test zone" as recited in claim 28.

Thus, Applicants respectfully submit that claims 1 and 28 are patentable over Lan. Reconsideration and withdrawal of this rejection is respectfully requested. Additionally, Applicant submits that claims 1 and 28 are patentable over WO02/19415, previously cited. Claims 1, 16, and 18 depend from claim 1, and claims 29-30 depend from claim 28 and are therefore patentable for at least the same reasons.

Claim Rejections – 35 U.S.C. §103

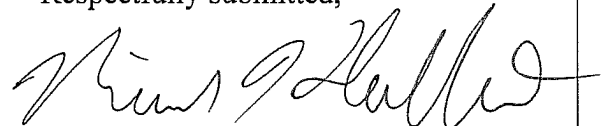
Claims 12-15 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hsu further in view of Ballarin (6,876,092).

Claims 12-15 and 20 depend from claim 1 as a base claim. Ballarin does make up for the deficiencies of Hsu discussed above. Accordingly, claims 12-15, and 20 are patentable over the combination of Hsu and Ballarin for at least the same reasons that claim 1 is patentable over Hsu. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1, 5, 8-10, 12-16, 18-21, and 26-29 have been amended and no claims cancelled, leaving claims 1-21 and 26-30 pending. For the above reasons, Applicants respectfully request allowance of all pending claims. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 378-7777 ext 112.

FILED ELECTRONICALLY

Respectfully submitted,



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